

REMARKS

Claims 1-18 are pending in this application. Claim 1 is the only independent claim.

I. Priority claim

In the Office Action, it is alleged that the priority document (certified copy of French Application No. 0301273) has not been received.

It is noted that this application is a national stage of an international application in which the certified copy of the priority document was transmitted by the International Bureau of the PCT. Further, upon checking the PAIR database, it appears that the certified copy is indeed present in the file (under code “FPRP” with date of May 6, 2005, i.e., the filing date of the US national stage application).

In view of the above, it is submitted that the objection should be withdrawn.

II. Obviousness rejection based on Osanai

In the Office Action, claims 1-18 are rejected under 35 U.S.C. 103(a) as obvious over US 4,704,683 to Osanai (“Osanai”) in view of US 6,188,946 to Suzuki et al. (“Suzuki”).

The rejection is respectfully traversed. As acknowledged in the Office Action, Osanai is silent regarding the permanent mode with non-zero mean variation. Further, contrary to the assertion in the Office Action, Suzuki does not remedy the deficiencies of Osanai. In particular, Fig. 3 of Suzuki does not relate to the variation of the gear ratio with time, but to a map of the gear ratio as a function of vehicle speed (abscissa) and transmission speed (ordinate).

The basic idea of the system of Suzuki is to impose an upshift prohibition zone at low speed values to facilitate starting on an uphill or in low friction conditions. Fig. 4 of Suzuki shows the variation of the relevant parameters with time. Thus, i_p is the target upshift threshold which is adjusted at time t_{spin} to take into account low friction conditions. This threshold i_p is then adjusted progressively until it becomes fixed when the vehicle stands still again at time t_3 . In the meantime, the actual gear ratio varies from its largest value down to close to the threshold, then increases again until standstill time t_3 . There is absolutely no indication in Suzuki of any set mean variation in any of these periods, let alone the combination of such a permanent mode and a transient mode, as in the present invention.

In contrast, in the present invention, as recited in present claim 1, a mode of operation is determined from amongst a permanent mode and a transient mode, as a function of a set of variables comprising said estimated values (P_1 , V , ω); and the value of the speed of rotation (ω) of the outlet shaft is corrected in such a manner that:

- if the mode has been determined as being the permanent mode, then the mean variation per unit time (L') of the gear ratio (L) over a period (T) of a plurality of unit time intervals (t_i) lies between a first threshold value (S_1) that is negative and a second threshold value (S_2) that is positive, wherein the mean variation per unit time (L') is set with an absolute value of more than zero for the duration of at least a portion of the permanent mode; and

· if the mode has been determined as being the transient mode, then said mean variation per unit time (L') of the gear ratio (L) lies outside the range of values defined by the first and second threshold value (S_1 , S_2).

An advantage of the presently claimed invention is to enable combining advantages of both mechanical and continuously variable transmissions, for example (i) avoiding a fixed gear ratio during permanent operating stages makes it possible to adapt the engine speed and gear ratio more finely to the required output and fuel economy, while (ii) producing a noise variation characteristic familiar to the driver used to mechanical gearboxes, when, in the permanent mode, a the mean variation of the gear ratio has a set non-zero value in at least a portion of the permanent mode within thresholds (i.e., a set, moderate mean variation), and in the transient mode, the mean variation has a value outside of these thresholds.

In this regard, it is noted that, contrary to the comment on page 4, first paragraph of the Office Action, there is not necessarily a “positive mean variation between thresholds” in the permanent mode of the present invention. Rather, it is the absolute value of the mean variation per unit time (L') that is set at a non-zero, positive value, but the mean variation per unit time (L') of the gear ratio (L) over a period (T) of a plurality of unit time intervals (t_i) lies between a first threshold value (S_1) that is negative and a second threshold value (S_2), as recited in present claim 1. In other words, the mean variation may have a positive or negative value in the permanent mode, provided it is not outside of the range [S_1 -- S_2].

Further, with respect to the dependent claims, it is submitted that the combined features of each of these respective claims are not taught or suggested in Osanai and Suzuki taken alone or in any combination. Therefore, each of the respective dependent claims is not obvious over Osanai and Suzuki taken alone or in any combination.

In view of the above, it is submitted that the rejection should be withdrawn.

III. Obviousness rejections based on Nakawaki

In the Office Action, claims 1-3 are rejected under 35 U.S.C. 103(a) as obvious over US 4,836,056 to Nakawaki et al. (“Nakawaki”) in view of US 6,188,946 to Suzuki et al. (“Suzuki”).

Further, in the Office Action, claims 10-13 are rejected under 35 U.S.C. 103(a) as obvious over Osanai in view of Suzuki and further in view of Nakawaki, claim 16 is also rejected under 35 U.S.C. 103(a) [the Office Action indicates section 102(b) but this is understood as a typographical error] as obvious over Osanai in view of Suzuki and further in view of Nakawaki, and claims 17-18 are rejected under 35 U.S.C. 103(a) as obvious over Osanai in view of Suzuki and further in view of FR 3,789,683 to Guichard et al. (“Guichard”).

The rejections are respectfully traversed. As explained above in Part II, it is submitted that Suzuki is completely silent regarding a permanent mode having a set mean variation, let alone the combination of such a permanent mode and a transient mode, as in the present invention. Thus, Suzuki fails to remedy the deficiencies of the other cited references.

In summary, as explained in the previous response, the presently claimed invention makes it possible to control the variation of the speed ratio to “imitate” to some extent a manual

gear box, such as avoiding sudden engine noise and/or transmission sliding effect during the permanent mode (because of the limits to the setting of the mean variation L'), as well as simulating gear changes through the alternation of permanent and transient modes, while still benefiting to some extent from the advantages of a continuously variable transmission (i.e., especially since the mean variation L' allows for an adjustment of the gear ratio even during the permanent mode). Such characteristics are apparent in the embodiment illustrated on Fig. 2 of the present specification.

Thus, the present invention makes it possible to adjust the engine speed and gear ratio to the required output and fuel economy so as to benefit from the continuously variable transmission, while still producing a noise variation familiar to a driver who is used to a manual gear box, i.e., in particular, with relatively stable permanent modes (mean variation per unit time L' in range defined by thresholds) and intermediary transient modes (mean variation per unit time L' outside of range).

Further, with respect to the dependent claims, it is submitted that the combined features of each of these respective claims are not taught or suggested in the cited references taken alone or in any combination. Therefore, each of the respective dependent claims is not obvious over the cited references taken alone or in any combination.

In view of the above, it is submitted that the rejections should be withdrawn.

In conclusion, the invention as presently claimed is patentable. It is believed that the claims are in allowable condition and a notice to that effect is earnestly requested.

Request for Reconsideration
U.S. Appl. No. **10/538,172**
Attorney Docket No. **052598**

In the event there is, in the Examiner's opinion, any outstanding issue and such issue may be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of the response period. Please charge the fee for such extension and any other fees which may be required to our Deposit Account No. 502759.

Respectfully submitted,

/nicolas seckel/

Nicolas E. Seckel
Attorney for Applicants
Reg. No. 44,373

Nicolas E. Seckel
Patent Attorney
1250 Connecticut Avenue NW Suite 700
Washington, DC 20036
Tel: (202) 669-5169
Fax: (202) 822-1257
Customer No.: 29980
NES/rep